International Journal of Geometric Methods in Modern Physics 2018

A new look at the Schrödinger equation in exact scalar field cosmology

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2019 World Scientific Publishing Company. We propose a new representation of the Schrödinger-like equation for scalar field Friedmann cosmology where the scalar field is the argument, and the Hubble parameter is the analogue to the wave function. Such an approach gives us the possibility to use the Schrödinger potential as a generating function which leads to generalization of known exact solutions. Further, we find a simple transformation of the Hubble parameter which generates new solutions from the Schrödinger-like equation. Several examples are identified where exact forms for the scale factor, Hubble parameter and scalar potential can be written in closed form. Earlier results are regained in our approach.

http://dx.doi.org/10.1142/S0219887819500221

Keywords

Exact solutions, inflation, scalar field